Utilizing a Machine Learning Algorithm for Wideband Channel Estimation and Signal Prediction

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Research Question:

How do we leverage existing GNU Radio and MATLAB environments to develop channel estimation methods and build large datasets of channel estimates.

Research Tools:

MATLAB, GNU Radio flowgraphs, Python, Ettus USRP B200 and Blade RF software-defined radios (SDRs).

Obstacles:

Knowing how fine the grid should be to collect an accurate dataset.

Findings:

Cheap low-quality SDRs have a large internal noise figure that can make it difficult to produce actual channel estimates.
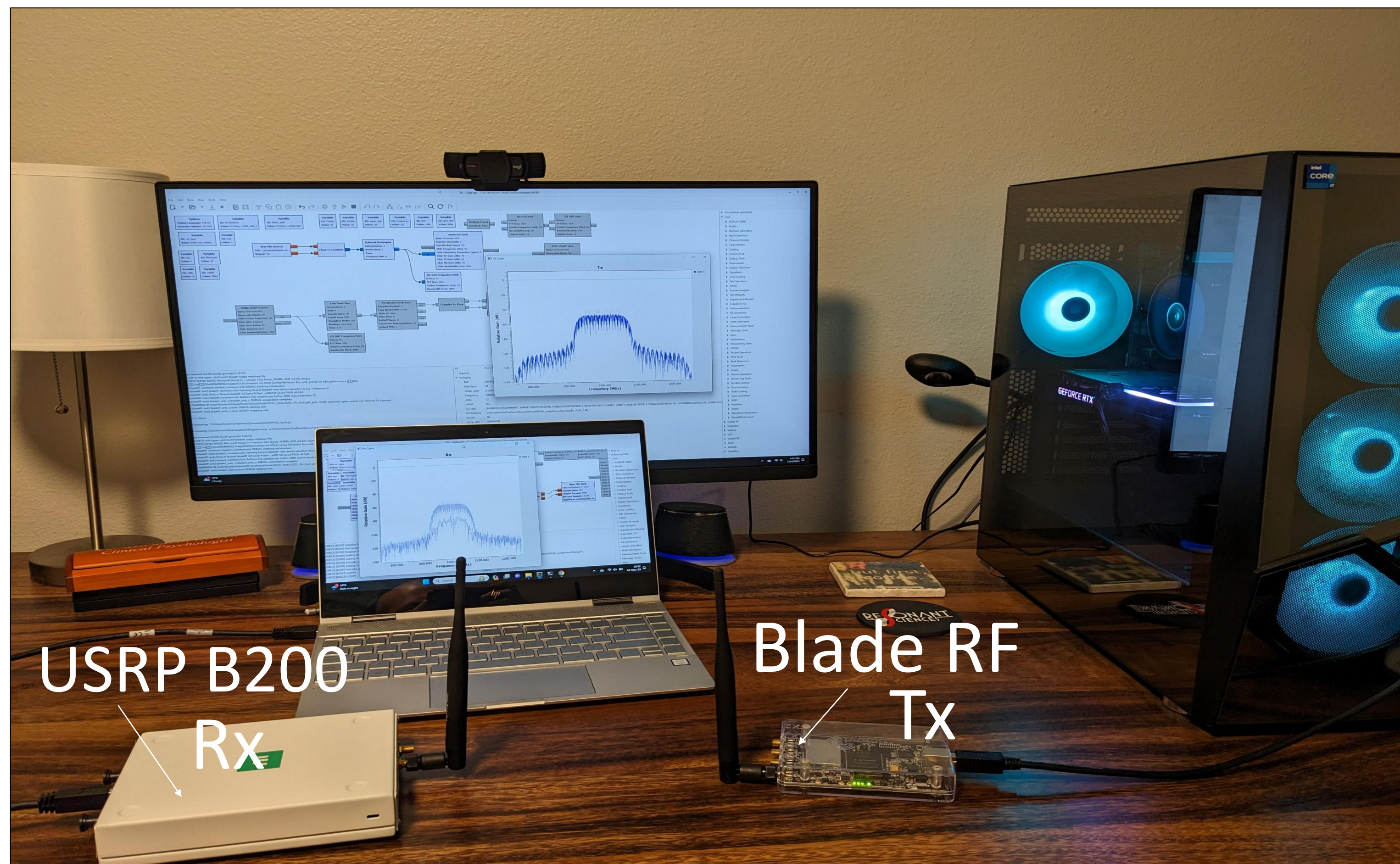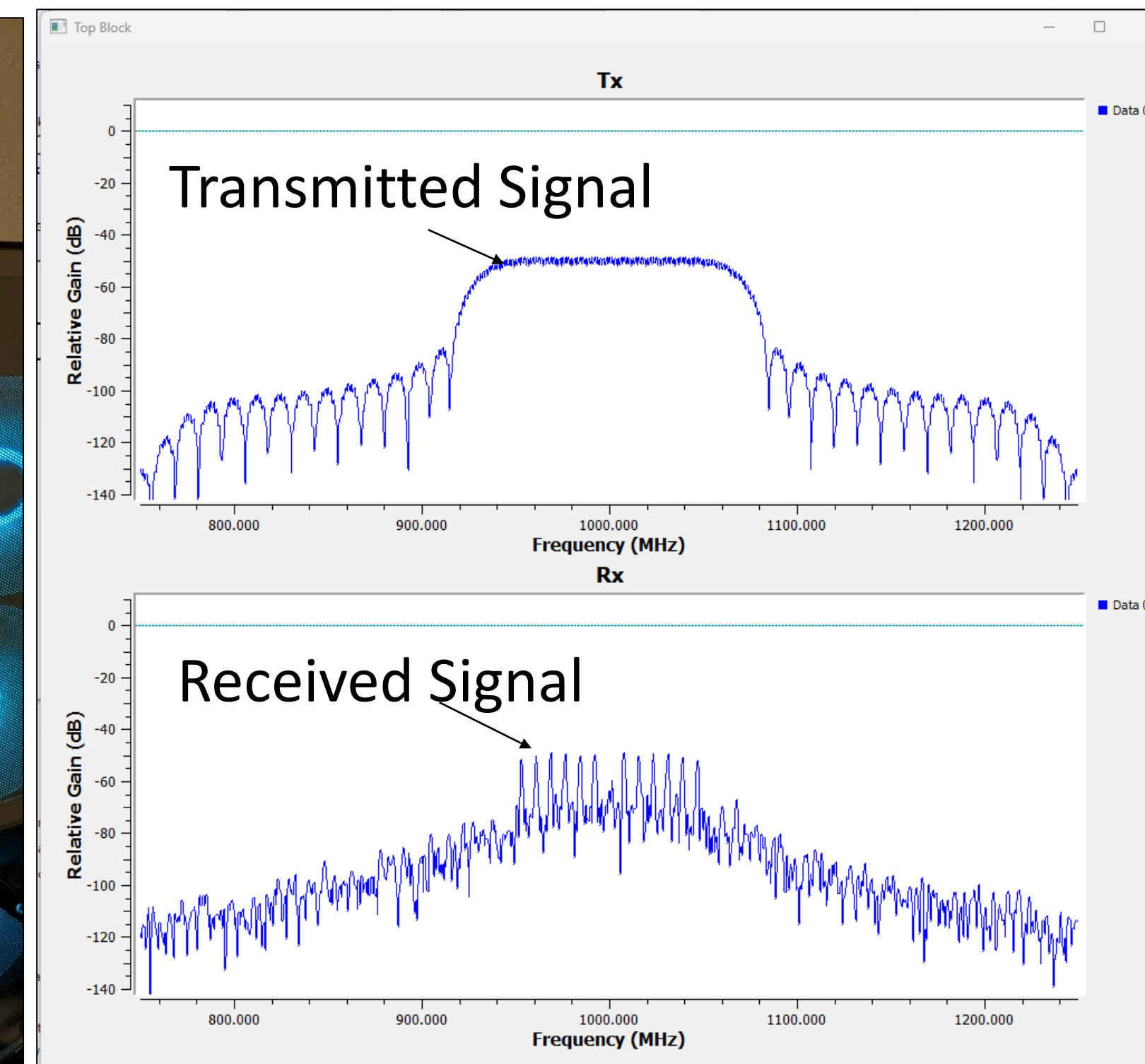

Fig. 1: Transmit and Receive SDRs

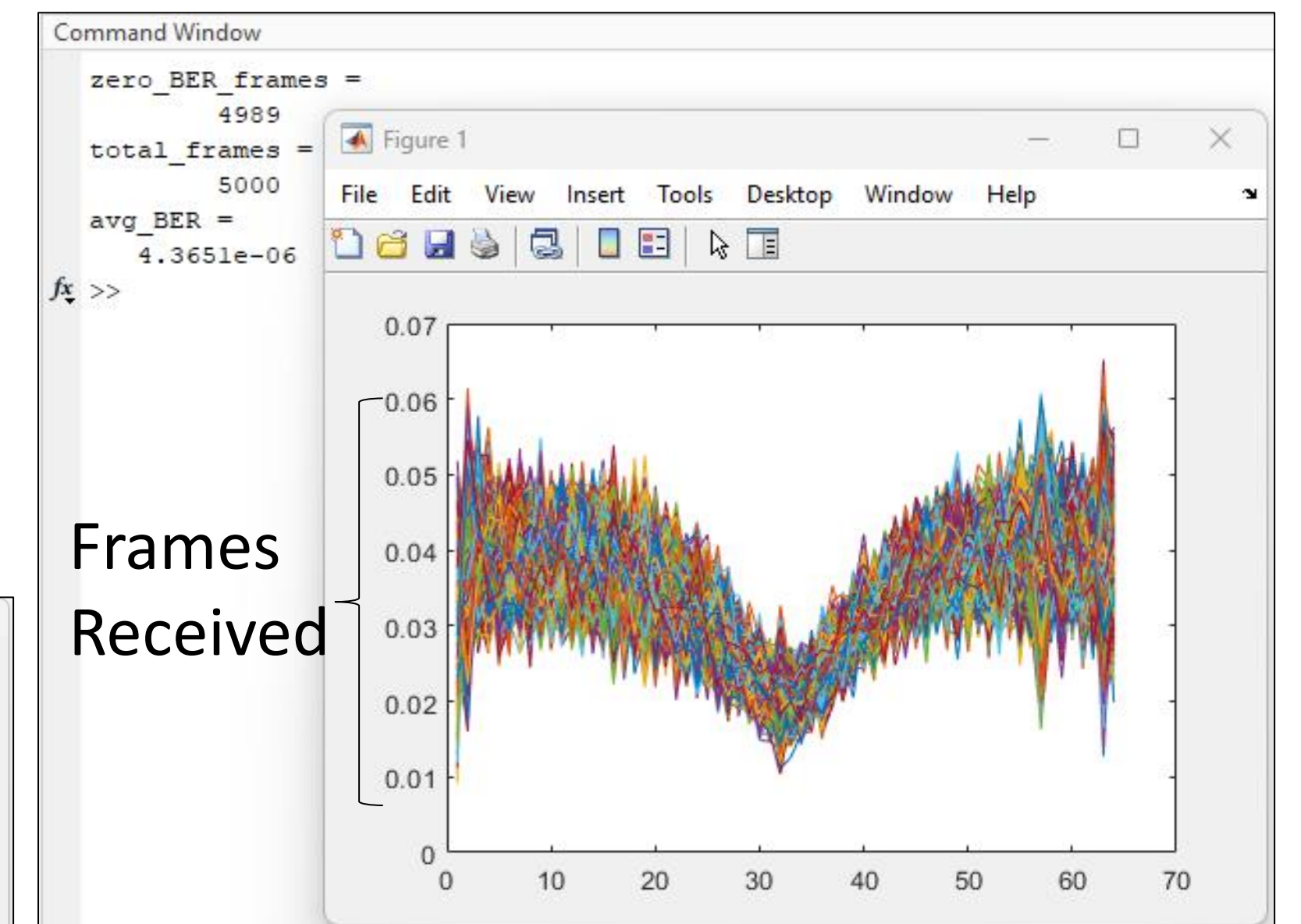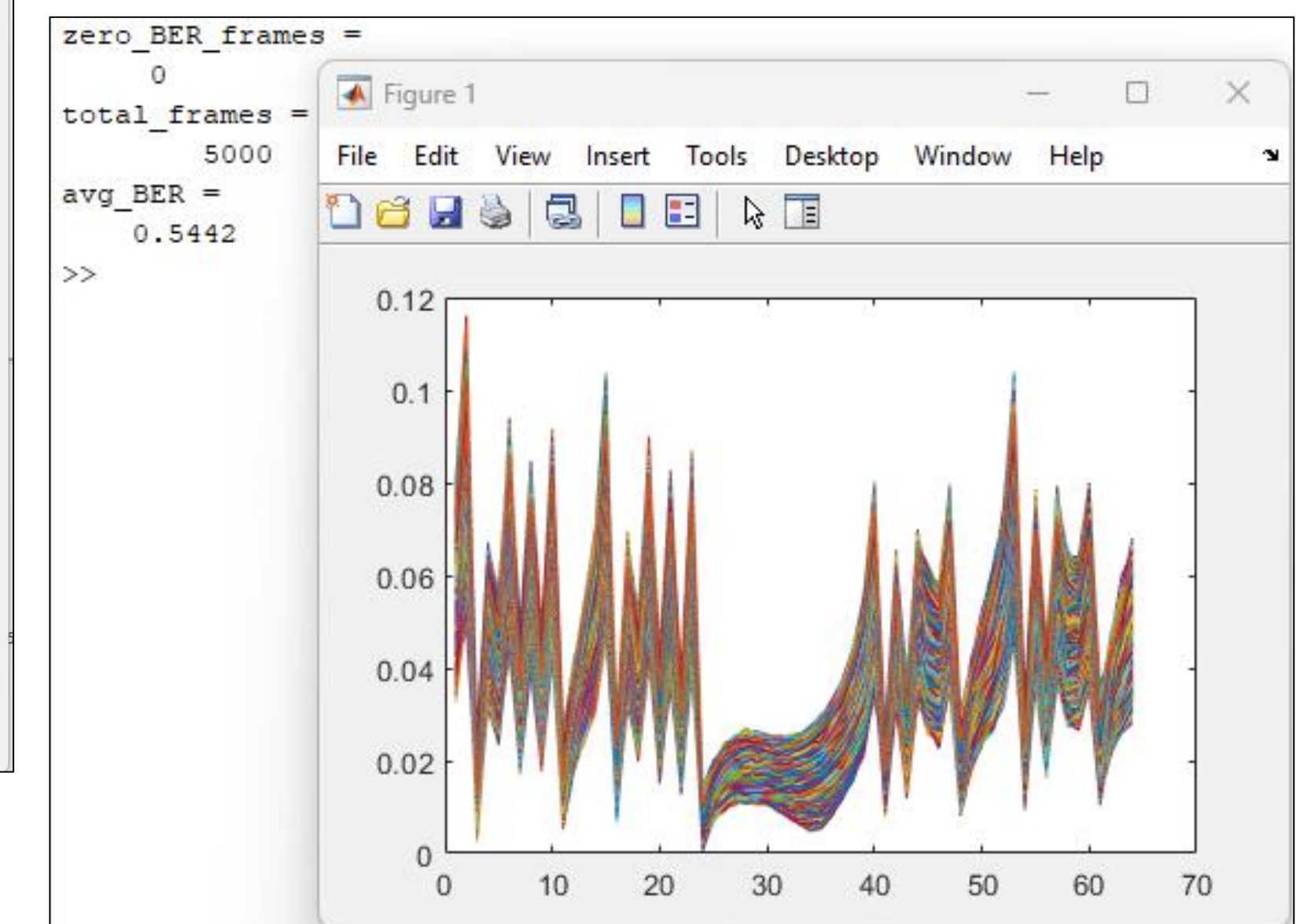Fig. 2: Transmitted and Received Signals

Fig. 3: Received Frames with a Good Bit Error Rate

Fig. 4: Received Frames with a Bad Bit Error Rate

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